PROGRESS REPORTS

FROM

EXPERIMENT STATIONS

SEASON 1960-61

TANGANYIKA TERRITORY
LAKE PROVINCE

N.C.P.
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TANGANYIKA TERRITORY
LAKE PROVINCE

PROGRESS REPORT FOR THE SEASON 1960-61

Cotton Season

Sowing: Ukiriguru, December 1960.
Picking: Ukiriguru, May to mid July 1961.
Rainfall: Ukiriguru, 1st October 1960 to 30th June 1961, 28·49 inches.

Introduction

by

G. M. Wickens

Western Regional Research Centre, Ukiriguru

Staff.—Mr. and Mrs. M. H. Arnold left on transfer to Namulonge on 13th June 1961, and Mr. J. E. Cross arrived on transfer from Ilonga on 14th March and went on leave on 6th May, returning to duty on 20th August.

Mr. K. J. Brown was on leave from 14th April to 18th July, Mr. A. M. Kabaara from 5th August to 26th August, and Dr. G. M. Wickens from 3rd July to 9th November.

General.—The season was not climatically favourable throughout the Province generally. In the southern areas the November and December rains failed, and sowing was delayed until February or even later. In other areas, rainfall was erratic. The crop (including the usual small contribution from the Western Province) totalled 163,041 bales (400 lb), about the same as the previous year.

At Ukiriguru conditions were less unfavourable than generally. Short periods of rainfall in November and December (see Table I for monthly totals), were successfully used for timely land preparation and crop establishment.

Work on the three families of bacterial blight resistant Albar hybrids continued. Selections from the G2.1 family have been made for bulking as likely components of a UK61 seed issue. This bulking will provide further information on quality before the final composition of UK61 is determined. UK61, destined for the wetter areas of the North, is expected to have the following characteristics as compared with UK58: superior yield potential through its resistance to bacterial blight; ginning percentage at least equal; lint slightly longer and finer.

TABLE 1

METEOROLOGICAL DATA, UKIRIGURU, OCTOBER 1960 TO SEPTEMBER 1961

WITH MEANS OF PREVIOUS SEASONS

Lat. 2°42′S, Long. 33°1′E, Alt. 3,933 ft.

Month	*Rainfall inches*		*Days rain*		*Relative humidity*				*Maximum temp. °F (Screen)*		*Minimum temp. °F (Screen)*		*Sunshine daily mean hours* (1)		*Computed evaporation* (2) *inches*
					1960-61		1946-61								
	1960-61	1931-61	1960-61	1931-61	09·00 hrs	15·00 hrs	09·00 hrs	15·00 hrs	1960-61	1946-61	1960-61	1946-61	1960-61	1959-61	
Oct. 1960	2·16	1·49	8	5·6	59	43	63	41	87·3	86·2	65·6	65·4	8·4	—	7·73
November	4·12	3·84	12	11·8	67	52	72	50	83·3	83·6	65·5	65·7	8·1	—	5·93
December	4·08	4·08	7	12·3	63	41	77	53	86·4	82·2	66·2	64·8	8·9	—	7·34
Jan. 1961	1·25	3·62	5	10·2	63	39	79	52	86·7	83·0	66·1	64·6	8·5	—	7·38
February	4·58	3·36	14	9·7	81	60	76	52	79·9	83·3	64·6	64·7	6·1	6·5	5·37
March	4·58	4·81	16	13·0	79	61	80	53	82·4	83·3	65·0	64·8	7·6	6·3	6·46
April	4·51	5·46	14	14·7	80	59	79	58	81·2	82·1	64·8	64·3	7·4	7·6	5·32
May	3·21	2·74	9	9·3	70	50	79	53	83·7	82·3	65·3	63·6	8·6	8·9	5·98
June	0·00	0·39	0	1·8	54	36	72	43	84·4	83·4	62·9	60·9	9·4	9·9	6·19
July	0·01	0·04	1	0·4	54	31	67	39	83·6	83·7	61·7	59·8	9·6	9·7	7·06
August	1·59	0·43	1	1·9	59	36	66	39	83·6	84·4	63·7	61·8	8·3	8·9	6·95
September	0·28	0·88	2	3·3	51	35	62	40	86·3	86·0	65·5	64·3	7·7	7·2	7·80
Totals	30·37	31·14	89	94·0											79·51
Means					65	45	73	48	84·0	83·6	64·7	63·7	8·2	—	6·62

(1) Campbell-Stokes sunshine recorder.

(2) From Penman equation, using values of radiation from Gunn-Bellani integrator.

Selections from the two families, UKA 67 and UKA 21, in trials in the drier and harder southern areas, have considerably outyielded the current commercial varieties. Some of them had considerably higher ginning percentages. It is anticipated that some of these selections, of high bacterial blight resistance and maintained jassid resistance, will constitute a new seed issue for these areas if the trade is satisfied on quality.

Studies on the use of 3-ft ridges as compared with the local traditional 5-ft ridges continue to show only small yield differences. So far it seems that with contour planning 3-ft ridges can stand up satisfactorily to the heavy rainstorms that sometimes occur, but more experience is needed. An interesting interaction was found between different varieties and ridge-spacing, and requires further investigation.

Sulphate of ammonia applied in the furrows before the ridges were split, so that it was at the base of the new ridges below the crests, again gave a smaller yield increment than when applied as a top dressing at flowering (72% of the latter increment). Nevertheless the return was highly economic, and at the present time the method is regarded as more practical in peasant agriculture.

An experiment designed to increase the length of the vegetative phase of plant growth by restricting early boll formation gave remarkable results. Plants which had all flowers removed for the first 20 days of flowering set a greater number of bolls later, during the peak period of flowering, and had larger bolls than did plants left to flower normally. The result was that final yields were doubled.

The results of soil nitrate studies, started in 1956 and now concluded, are summarized in the section on soil science. Evidence is accumulating to suggest that in some local soils calcium nutrition may be inadequate. This will be further studied.

The Fusarium wilt survey made by departmental staff has again indicated that the disease is gradually increasing. Notable newly discovered occurrences, confirmed in the laboratory, were on Ukerewe Island (although here it seems certain that the disease has in fact been present for 2 or 3 years at least), and at a point near the Lake shore, some 35 miles east of any other known. Undoubtedly the vigorously pursued policy of preventing movement of sowing seed out of known infected areas has greatly restricted extension of the disease. Much useful supplementary information has been gathered, which will provide a basis for the more detailed studies for which laboratory and glasshouse facilities have been built up.

Cotton Breeding

BY

M. H. ARNOLD, K. J. BROWN and J. E. CROSS

Growing conditions were difficult throughout the Province this season, in many areas sowing being delayed by drought until early February or even March. In general, the district variety trials, most of which are peasant cultivated, are subject to the same hazards as the bulk of the commercial crop and it is gratifying that under these conditions the three current seed issues again gave very satisfactory yield increases (see Table 2). The mean increase in lint yield for UK51 over the old MZ561 was 19%, whilst for UK55 and UK58 the increases were 28% and 27%.

Table 2

Performance of seed issues relative to MZ561 over all main variety trials

	Means of 17 trials, 1960-61			*Means of 36 trials, 1958-59 and 1959-60*		
	Lint yield			*Lint yield*		
Seed issue	*lb per acre*	*as % of MZ561*	*Ginning percentage*	*lb per acre*	*as % of MZ561*	*Ginning percentage*
MZ561	235	100	32·3	228	100	32·5
UK51	279	119	34·2	273	120	33·6
UK55	301	128	35·1	296	130	34·8
UK58	298	127	35·3	305	134	35·0

Multiplication of UK55 and UK58 is being carried out as rapidly as possible in the Province and in the coming season there will be sufficient seed of these two issues for approximately one third of the growing area. Reports on the lint quality continue to be satisfactory and it is interesting to note that when large bulks of these issues, grown from replicated trials, were ginned at a commercial ginnery under the supervision of officers of the Lint and Seed Marketing Board, an overall increase in ginning percentage of 0·5 over UK51 was obtained.

As a result of detailed discussions between all concerned, a scheme for issuing Albar hybrid (now designated UKA) seed has been worked out. This takes into account, with respects to its effect on lint quality, the climatic difference between the wetter areas to the North of the Province and the dryer areas to the South. It has been agreed that a UK61 seed issue shall be constituted from the longer, finer linted types for issue in the North, and thus exploit the potential for somewhat longer staple under conditions of higher rainfall. The object will be to increase the average commercial staple length in these areas by approximately 1/32nd of an inch. In the following year a UK62 seed issue of standard lint quality will be constituted from other UKA selections for distribution in the South.

With this programme in mind, the results from the district variety trials shown in Table 3 have been split into groups corresponding to the northern and southern climatic areas of the Province. Results from these trials tended to be more irregular than usual, coefficients of variation ranging from 10% to 25%. This was to a large extent associated with the drought conditions at the beginning of the season resulting in difficulties in land preparation and crop establishment. In general, however, the results confirm those of previous seasons. It is expected that, in the absence of bacterial blight, UK61 will be approximately equal to UK58 in yield and ginning percentage, its main advantages being resistance to bacterial blight, giving yield stability when conditions favour the disease, and improved lint quality. Preliminary reports from brokers and classifiers on the quality of lint samples of possible components of UK61 have been most favourable. The eight possible component strains are now being bulked on the station in order to provide about 15 tons of seed from the first stage of multiplication.

TABLE 3

PERFORMANCE OF UKA SELECTIONS RELATIVE TO UK58 IN MAIN VARIETY TRIALS

Strain	*Lint yield*		*Ginning percentage*
	lb per acre	*as % of UK58*	
A. Possible components of UK61			
(i) Means of 6 trials			
UK58	432	100	35·3
UKA G2.1/I7/904	401	93	36·1
UKA G2.1/I8/185	423	98	35·3
(ii) Means of 2 trials (reselections from UKA G2.1 family)			
UK58	273	100	36·2
UKA 59/206	302	111	36·0
209	283	104	37·9
488	298	109	36·7
494	276	101	35·9
513	313	115	36·9
515	311	114	38·0
B. Families from which possible components of UK62 will be taken Means of 8 trials			
UK58	272	100	35·6
UKA 67/I7/86	355	131	37·9
105	323	119	37·8
UKA 121/I7/174	283	104	37·3
180	288	106	37·0

In UK62 it may be possible to exploit the very high yield potential of some of the UKA 67 strains such as 67/I7/86 shown at the bottom of Table 3, which for two consecutive seasons has given outstanding yields and a mean ginning percentage of 2·3 above that of UK58. Whether strains of this type can be used will depend on final assessments of the

lint. Classifiers' reports on 67/I7/86 suggest that it is slightly off character from accepted "AR MZA" quality but recent spinning test reports from the Shirley Institute indicate that reselections from this material show some variation and hence it may be possible to constitute a multiline strain which will be acceptable to the trade. Other strains in this group, though less high yielding, are closer in lint quality to the current commercial issues.

A start has been made on investigating the effects of mixing together, in multiline strains, stocks derived from the same or different families. This will be carried out with respect to lint quality and to yield. Studies are to be made of the extent of natural outcrossing, the combining ability of a range of UKA selections and the magnitude of possible heterotic effects. The hybrids produced from crosses between widely different families in this programme may provide valuable stocks for reselection, since estimates of heritability in families UKA 67 and UKA 121 this season were 0 and 0·17 for seed weight and 0·03 and 0 for lint index respectively. This will be followed up in the coming season but there is a strong suggestion from these and other results that intensive selection for high resistance and high yield, which has been carried out in the main families for the past five years, has been associated with a marked reduction in genetic variability.

Agronomy and Crop Physiology

BY

K. J. BROWN

Highly Fertilised and Exhaustion Plots

As in previous years the results from an experiment containing highly fertilized plots are given to demonstrate that it is possible to maintain a high level of fertility on fields continuously cropped, to which adequate compost and fertiliser are supplied.

Table 4

Yields of exhaustion plots: trial 25 Macharu

Seed cotton in lb per acre

	"High Field"	*Exhaustion plot (cropped continuously since 1939)*
Four year average (seasons 1956-57 to 1959-60)	1847	445
Current season (1960-61)	1974	382

Fertilizers

Fertilizers may be applied in the furrows before the old ridges are split to form new ridges for sowing the cotton crop. This method is

regarded as most practical for the peasant farmer and gives highly profitable returns, but in Trial 26 last season it was shown that nitrogen applied in this way was less efficiently utilized than nitrogen added as a top dressing at flowering time. This season has confirmed these findings; the response to seed bed nitrogen was only 72% of the response to a top-dressing with nitrogen. Once again the control yields were exceptionally low, 276 lb of seed cotton per acre, and there are indications that a number of factors other than shortage of nitrogen and phosphate are causing this depression. The pH of the soil is depressed and it is possible that calcium deficiency may be playing a part.

Table 5 gives the results of an experiment to test the effect of different nitrogen fertilisers on yield. It is proposed to continue these applications for a number of years and study their effect on the soil pH and base status.

TABLE 5

NITROGEN EXPERIMENT

Treatment	*Seed cotton yields in lb per acre*	
Control	483	
66 lb sulphate of ammonia per acre	644	721
132 lb sulphate of ammonia per acre	839	
100 lb calcium ammonium nitrate per acre	820	
45 lb urea per acre	753	
S.E.	±59·5	

The dressings of calcium ammonium nitrate and urea were chosen such that the rates of nitrogen per acre would approximate to 20·5 lb. This is the equivalent of 100 lb of sulphate of ammonia per acre, the recommended rate of application. All plots had a basal dressing of double superphosphate. The mean yield of plots receiving sulphate of ammonia at the rates of 66 lb and 132 lb per acre (average 100 lb. equivalent to 20·5 N)was 721 lb of seed cotton per acre. The yield of the plots receiving the same quantity of N as urea did not differ greatly from this. The yield obtained with an application of calcium ammonium nitrate was, however, greater. This may perhaps be taken to support the contention that calcium is needed by exhausted hillsands. However, a certain amount of calcium is supplied in the double superphosphate and previous dressings of gypsum did not give any response. Further studies are necessary.

Population Studies

The yields of cotton on ridges of three and five feet width with maximum populations of 14,500 and 11,600 stands per acre were investigated in a factorial experiment. Two varieties were used, both

high yielding but one an early maturing Albar hybrid strain. Results are shown in Table 6.

TABLE 6

TRIAL OF SPACINGS AND RIDGE SIZES WITH TWO VARIETIES

Yields of seed cotton in lb per acre

	UK55		*UKA 67/I7/86*		*Ridge mean*
	Stands per acre		*Stands per acre*		
	11,600	*14,500*	*11,600*	*14,500*	
3 ft ridge	1,888	2,080	2,150	2,105	2,056
5 ft ridge	1,930	1,941	2,486	2,571	2,232
					S.E. ±52·9
Variety mean	1,959		2,328		
	S.E. ±52·9				

Spacing means: 11,600 stands per acre = 2,113
14,500 stands per acre = 2,174
S.E. ±52·9

The overall means show there is a slight advantage on the 5-ft ridges but this is due to the greatly increased yields of 67/I7/86 on the larger ridge. This variety gave the biggest yield on 5-ft ridges at the closer spacing. The interaction of ridge size and variety is highly significant and will be further investigated.

Previous experiments have not detected the difference in yield between 3-ft and 5-ft ridges, but only varieties similar to UK55 were used.

Observations on the Removal of Early Flowers

Previous growth studies have suggested that prolongation of the vegetative stage might lead to increased yields of cotton. Cessation of vegetative growth nearly always coincided with the formation of the first bolls which is approximately 90 days from sowing. A simple trial with 3 replications of the effects of removing early flowers gave outstanding yield differences; the results are given in Table 7.

Complete growth analyses were not made owing to absence of staff on leave, but a count of the numbers of open boll cases was made after harvest and the boll weights obtained by calculation. The data indicate that the biggest factor contributing to increased yield was the large increase in boll size when flowers produced during the first 20 days of the flowering period were removed. Although these calculated figures are subject to errors due to shed boll cases being missed, the magnitude of the differences is such that they must constitute a real effect. There were also more bolls on plants from which flowers had been removed but the increases were proportionately much smaller than the increases in boll weight.

In the coming season, a more elaborate trial covering an extended period of flower removal is planned; a number of varieties from different families will be included.

TABLE 7

TRIAL OF REMOVAL OF EARLY FLOWERS

Treatment	*Yields of seed cotton in lb per acre*	*Bolls harvested per acre*	*Mean weight seed cotton per boll g*
Normal growth	1,205	188,034	2·9
Flowers removed for 10 days	1,652	205,216	3·7
Flowers removed for 20 days	2,436	212,476	5·2
S.E.	±95·0(1)		

(1) Four degrees of freedom

SOIL SCIENCE

BY

A. M. KABAARA

Nitrate Studies

This work, started in 1956, has been concluded during this last season. Broadly, the following points have been established.

1. *Pattern of nitrate fluctuation in cropped soil without nitrogen fertilizer.*—At the beginning of the rains there is a flush of nitrate which is considered to be due to the nitrification of natural soil organic matter. This flush is not always obvious and, as shown by other workers in East Africa, its magnitude is controlled to a large extent by the duration of the drought period prior to the rains (c.f. Birch, 1959, 1960). After the crop is established, nitrate values fall to very low levels, especially where phosphate is applied.

2. *Pattern of nitrate fluctuation in cropped soil with nitrogen fertilizer.*—The levels of nitrate are naturally higher than where no nitrogen has been given. In the absence of phosphate, not all of this nitrogen is used and it appears as a residual in the February dry period, and also as a higher peak at the onset of the rains.

3. *Relationship between soil moisture and soil nitrate.*—At a given level of nitrate, various fluctuations associated with the moisture status have been detected. A moisture level above field capacity just after the fertilizer has been applied causes downward leaching of nitrate. In the period April-May when the rains have practically stopped, increasing nitrate values at the top horizons are associated with a drying out and upward movement of nitrate (c.f. Wetselaar and

Norman, 1960). During the height of the dry season, nitrates remain low; this is accounted for microbiologically, the nitrate being locked up as microbial protein which is only mineralised on wetting the soil.

4. *The NP interaction.*—For several years field experiments at Ukiriguru have demonstrated a positive NP interaction. The explanation put forward has been that P enhances the uptake of N. Evidence in support of this has come in the form of lower nitrate values where P and N were given together, than where N was given alone.

5. *The effect of compost.*—Figures for plots receiving compost generally did not differ from those for plots not receiving it. Although analyses show that compost supplies N to the soil, the vigorous growth in the compost plots presumably keeps free nitrate at a low level.

Further Soil Fertility Studies

Studies are being continued on Trial 26 which has now gone through three cycles each of three years. This trial has now demonstrated the following aspects of the fertility of hillsand.

1. The residual effect of compost.
2. The gradual build-up in fertility on the compost plots as shown by increasing yield responses, and by an increase in organic matter and nutrient status as determined by chemical analysis. These aspects are being examined in detail.

Regarding the influence of compost, the analysis for exchangeable bases presented in the Progress Report for 1957-58 (page 8) showed that these had been increased where compost had been applied. This increase was especially marked with calcium.

Plant samples analysed this season show that content of calcium in the leaf is connected with the general level of yield. On plots receiving no fertilizer, leaf calcium was about 1·95 per cent in dry matter; this rose to 2·45 per cent on plots receiving superphosphate (superphosphate contains an appreciable content of calcium), and to 2·58 on plots receiving both phosphate and compost. Samples from an anthill on hillsand and lowland calcareous *mbuga* soil, on both of which cotton seems to do very well, gave figures of 3·29 and 4·24 respectively. Considering that there is a much greater uptake of minerals from the NPD plots than from the control plots, it is clear that far more calcium is taken up from the NPD plots than could be supplied by the control plots.

Over seven seasons in Trial 26, the pH dropped by one unit in the sulphate of ammonia plots. Figures quoted in the 1957-58 report

indicated that sulphate of ammonia caused a translocation of bases, principally calcium, down the profile, and consequent lowering of the pH in the surface layers.

In view of these results, and of the known high demand of cotton for calcium, calcium nutrition on local soils will be further investigated.

Soil Moisture Studies

This is not at present a major line of work. However, it is felt that some moisture work must be done in order better to define our environment and gather information which may be useful in the general interpretation of our results.

During the past season, a calibration of gypsum blocks against gravimetric soil moisture was done, and a curve has been obtained similar to the one obtained by Mr. J. K. Brown the previous year. These determinations were done on a drying phase of the soil. Field capacity was found to be about 8·5 to 8·9 per cent moisture on oven dry soil, corresponding to a resistance of 2·1 logohms. Permanent wilting point was determined using tomatoes grown in the glasshouse and this was 3·9 per cent on oven dry moisture, corresponding to 5·3 logohms on the gypsum blocks.

Bacterial Blight

BY

M. H. and K. M. ARNOLD

The yield advantage of resistant strains under various levels of disease attack was again studied in a series of variety trials. Results were comparable with those obtained in previous seasons and details of this work are now being prepared for publication.

Studies on variability for resistance were continued and three trials were devoted to testing reselections from the more important UKA families which will be possible components of the UK61 and UK62 seed issues. Each trial comprised 23 selections and two controls, the results being summarized in Figure 1. It can be seen that in most of the selections a very high level of resistance has now been achieved. Other aspects of this work will be published elsewhere.

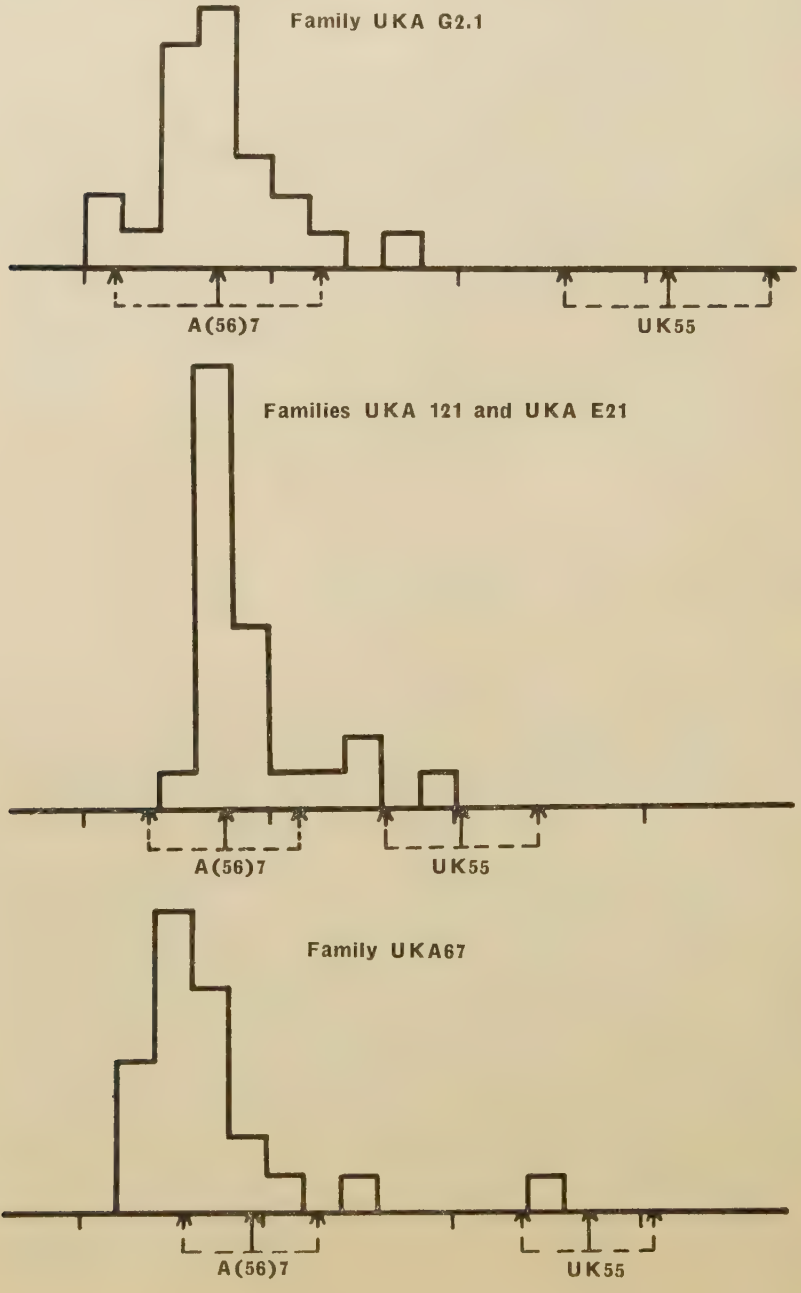
Two new seed dressings were tested in collaboration with Plant Protection Ltd., but neither showed any advantage over the standard Perecot formulation.

Work on trash-borne infection was concluded and details have already been published (Arnold and Arnold 1961).

FIGURE 1

DISTRIBUTIONS OF BOLL RESISTANCE TO BACTERIAL BLIGHT WITHIN THREE GROUPS OF UKA SELECTIONS COMPARED WITH STANDARD TYPES UK55 AND A(56)7

Each group contains 23 selections represented by the areas and positions of the columns. The position of the standard types in the scale of resistance is indicated beneath by a set of three arrows pointing to the mean and the limits set by the L.S.D. (P=0·05). The left end of the scale represents high resistance; A(56)7 is an Albar derivative.



Fusarium Wilt of Cotton

BY

G. M. WICKENS

The annual survey of wilt incidence, carried out in the field by staff of the Department of Agriculture, showed that the disease is steadily increasing in severity and extending. Notable newly discovered occurrences, confirmed in the laboratory by isolation of *Fusarium oxysporum* and pathogenicity tests, were on Ukerewe Island (although it seems certain that the disease has been present there for 2 or 3 years at least), and at a point near the Lake shore some 35 miles east of any other known. Occurrences up to about 10 miles inland from the Lake in Geita District have also been recorded. There can, however, be no doubt but that the vigorously pursued policy of avoiding movement of sowing seed out of known infected areas has greatly restricted extension of the disease.

Analysis of the data on previous cropping and on presence or apparent absence of root-knot nematode infection has shown, as before, general tendencies for wilt to be more severe the longer the history of continuous cotton, and more severe when root-knot was also present. The associations appear to be by no means obligatory: high incidence (of the order of thirty to forty per cent) has occurred in cotton following two years of cassava on land on which the disease had not been observed on a previous cotton crop; over fifty per cent has been recorded in the apparent absence of root-knot.

I am indebted to the Commonwealth Mycological Institute and to G. M. and J. K. Armstrong of Clemson, S. Carolina, U.S.A., for morphological and pathological studies respectively on isolates of the Tanganyika cotton-wilt Fusarium. These have established that isolates differ appreciably morphologically, while in pathogenicity to various hosts they behave similarly to the U.S. cotton-wilt Fusarium.

The various isolates have been taken to conservation culture for use in next season's programme for which laboratories and glasshouses are being installed and equipped.

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Appendix

Origin and Special Characteristics of the Main Cotton Strains Mentioned

Local	A mixture of Upland types introduced into the Lake Province from the turn of the century onwards—mainly from Uganda and Nyasaland.
MZ561	A straight selection from Local, first multiplied in 1939-40 season.
UK51	A multiline seed issue incorporating strains with jassid resistance, first multiplied in the 1951-52 season.
UK55	A multiline seed issue composed of strains outstanding for yield and jassid resistance. First multiplied in the 1955-56 season.
UK58	A multiline seed issue of similar characteristics and genetic origin to UK55, first multiplied in 1958-59 season.
Albar	Nigerian Allen (A1) blackarm resistant (bar) selections made at Namulonge. Two series of selections were made independently, Albar 49 and Albar 51 in 1949 and 1951 respectively.
Albar hybrids	A general term embracing selections from crosses between Albar 51 and strains of Local origin, backcrossed to the locally adapted types. These are now all being covered under the general prefix of "UKA".
UKA	A general prefix replacing the words "Albar hybrid".

Received February 1962

PROGRESS REPORTS FROM EXPERIMENT STATIONS

The reports for the seasons up to and including 1950-51 were published in seasonal volumes; the following are still in print and available at 3/- per volume post free.

1923-25 (one volume), 1926-27, 1931-32, 1934-35, 1935-36, 1942-43 and 1945-46 to 1950-51.

From 1951-52 the reports from each territory were published individually each season. A few of the 1951-52 reports are out of print, but all others are available post free at 2/6 per report or £1 for the seasonal set.

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